Report to Congress:

Perennial Crops, Pecans and the Federal Crop Insurance Program

Submitted by

Secretary of Agriculture Thomas J. Vilsack

as required by section 12030 of the Food, Conservation, and Energy Act of 2008

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The Risk Management Agency Administers
And Oversees All Programs Authorized Under
The Federal Crop Insurance Corporation

Executive Summary

Section 12030 of the Food, Conservation, and Energy Act of 2008 directed the Secretary of Agriculture to deliver to the House Committee on Agriculture and to the Senate Committee on Agriculture, Nutrition, and Forestry a report on options for addressing the effects of declining and variable yields for perennial crops in the Federal crop insurance program. Specifically, section 12030 reads as follows:

> *Not later than 180 days after the date of enactment of this Act, the Secretary shall submit to the Committee on Agriculture of the House of Representatives and the Committee on Agriculture, Nutrition, and Forestry of the Senate a report containing details about activities and administrative options of the Federal Crop Insurance Corporation and Risk Management Agency that address issues relating to—*
>
> *(1) declining yields on the actual production histories of producers; and*
>
> *(2) declining and variable yields for perennial crops, including pecans.*

This report is focused on the concerns specific to perennial crop producers, particularly the effects of downward trending and alternate bearing. A separate report to Congress will address the declining yield concerns of perennial and annual crop producers.

For most perennial crops productive capability is negligible until a certain stage of growth is reached. Once this point is attained production increases rapidly until some maximum physiological level is achieved and then remains relatively constant until age, disease, etc. begin to reduce the plant's productivity. Another physiological characteristic of some perennial crops is alternate bearing—a phenomenon characterized by alternating periods of high and low yields. Adverse environmental conditions are often thought to initiate alternate bearing as the stress may leave plants more susceptible to damage from conditions including freeze, high temperatures and drought, etc.

Procedures developed by the Risk Management Agency (RMA) provide adjustments to insurance guarantees to address downward trending and alternate bearing. Conceptually, such adjustments may be appropriate if the insurance guarantee is to be consistent with production expectations—though at the cost of potentially providing the producer with a lower insurance guarantee. The practical impact of these adjustments (or of not making adjustments) depends on how prevalent and predictable are these phenomena. If downward trending and alternate bearing are relatively frequent occurrences, providing guarantees higher than experience suggests is warranted will eventually necessitate premium rate increases. However, higher premium rates will lead to reduced program participation and/or negatively impact coverage level choices. Yet, reducing guarantees to reflect the effects of downward trending and alternate bearing may be perceived as decreasing the value of the crop insurance coverage. Therefore, key issues are: (1) how prevalent are downward trending and alternate bearing; and (2) how appropriate are the current procedural adjustments to address these situations.

Recognizing these concerns, in 2005, RMA solicited proposals for an evaluation of insurance coverage for perennial crops with a particular focus on the alternate bearing and downward trending adjustments. The objectives of the evaluation were to:

- Provide a comprehensive evaluation of the existing perennial crop actual production history (APH) insurance program, underwriting methods, and procedures;
- Provide an assessment of whether present underwriting methods and procedures are appropriate to maintain an actuarially sound insurance program and establish uniformity and consistency by crop or crops across RMA regions; and
- Provide recommendations for program improvements.

In regards to the frequency of alternate bearing and downward trending, the study noted that adjustments for these phenomena are not particularly prevalent, as indicated in the following passage:

> *Of the 50,191 databases, 1,165 (2.32%) were adjusted for alternate bearing and 851 (1.70%) were adjusted for down[ward] trending. In addition, 496 policies (0.99%) had the down[ward] trending adjustment waived via RO [RMA regional office]-issued underwriting guidelines and 1,848 (3.68%) had RO determined yields.*

Also, the study concluded that the current alternate bearing adjustment introduces significant complexity with relatively few offsetting benefits, noting that:

> *More generally, however, the inability of the CIH formula [RMA Crop Insurance Handbook adjustment procedure] to do a better job than a simple average predicting the next season's yield, coupled with the evidence of low persistence of the up-down pattern, lead us to conclude that the test is of little benefit in aggregate.*

A similar conclusion was reached with regard to the downward trending adjustment:

> *Down[ward] trending yields are a fact of life at some point for most of these crops. None of the formula adjustments do a very good job of predicting the coming year's yield. Only about half the time is the next year's yield actually below 75% of the APH. Nevertheless, our tests indicate that the CIH downward trending adjustment more accurately predicts yields than the APH yield for crops with a 10-year APH. However, moving to a shorter (four to six) year average would do almost as well.*

Based on the findings of the contracted evaluation, as well as its own analysis, RMA provides the following recommendations for addressing the effects of variable yields for perennial crops in the Federal crop insurance program.

1. Greater flexibility to establish the base period for determining the approved yield for perennial crops, in particular, by adopting a base period shorter than the current 10 years.

2. Replace the current catastrophic yield adjustment based on regional average yields with an adjustment based on the actual production history of the producer.

3. Restrict the use of the alternate bearing and downward trending adjustments when a shorter base period is implemented.

4. Enhance policy and procedure for adjustments in measured acreage when there is a significant reduction in the stand from the previous year.

5. Modify the Pecan Revenue program to specify a minimum level of revenue that must be achieved as a condition of insurability, reduce the minimum age requirement, and add percent stand requirements similar to other nut crops such as almonds. A catastrophic adjustment based on the producer's history would also be implemented for pecan growers, similar to that of other perennial crops as indicated in recommendation 2.

Recommendations 1 and 2 above will require legislative changes in order for RMA to implement. Recommendation 3 can be accomplished administratively; however, the desired impact will not be achieved unless RMA is able to concurrently implement recommendation 1. Aside from the catastrophic adjustment for pecan growers, recommendations 4 and 5 require only administrative changes, which RMA is implementing.

1. Background

Section 12030 of the Food, Conservation, and Energy Act of 2008 (2008 Farm Bill) directed the Secretary of Agriculture (Secretary) to provide Congress with a report on options for addressing the effects of declining and variable yields for perennial crops in the Federal crop insurance program. Specifically, section 12030 reads as follows:

> *Not later than 180 days after the date of enactment of this Act, the Secretary shall submit to the Committee on Agriculture of the House of Representatives and the Committee on Agriculture, Nutrition, and Forestry of the Senate a report containing details about activities and administrative options of the Federal Crop Insurance Corporation and Risk Management Agency that address issues relating to—*
>
> *(1) declining yields on the actual production histories of producers; and*
>
> *(2) declining and variable yields for perennial crops, including pecans.*

As stated in the conference report "The Managers recognize risk management challenges faced by producers, especially with respect to declining yields in light of increases in premiums. Managers also understand that there are unique issues with yield variability for perennial crops, such as pecans. The Managers are interested in the Department of Agriculture's activities to address these issues and options that the Department has to address these issues administratively." This report is focused on the concerns specific to perennial crop producers, particularly the variable yield adjustments to reflect the effects of downward trending and alternate bearing. A separate report to Congress will address the declining yield concerns of perennial and annual crop producers.

A perennial crop, as defined by the Federal Crop Insurance Corporation (FCIC), is a plant, bush, tree, or vine crop that has a life span of more than one year.[1] Perennial crops insured under the actual production history (APH) plan of insurance include almonds, apples, avocados, citrus, blueberries, cranberries, figs, grapes, macadamia nuts, pears, plums, prunes, stonefruit (apricots, nectarines and peaches), table grapes, walnuts, and Hawaii Tropical Fruit (bananas, coffee and papaya). The APH plan of insurance protects against the loss of production due to natural causes such as hail, fire, drought, etc. The insurance guarantee for APH-based policies is based on an average of the insured producer's individual yield history. The producer selects the amount of the average yield he or she wishes to insure – from 50 to 75 percent[2] – in order to establish the insurance guarantee. If the actual yield is less than the insurance guarantee, the producer is paid an indemnity based on the difference. The amount of the indemnity is calculated as the product of the yield shortfall and the price election chosen by the producer. This price election is determined as the product of the expected market price (as determined by the Risk Management Agency (RMA)) and the percentage of that price the producer wishes to insure – from 55 to 100 percent.

Citrus crops in some areas, particularly in California and Florida, can also be insured under the Dollar Revenue plan of insurance. Dollar Revenue plans represent a hybrid between revenue

[1] Perennial plants (e.g., the trees, vines, bushes) are insurable under separate plans of insurance from perennial crops (fruits, nuts, etc.). This report focuses on insurance for perennial crops.

[2] For crops in some areas coverage levels of up to 85 percent are available.

coverage and yield coverage. The guarantee is based on the cost of growing a crop in a specific area, and there is one reference dollar value for a county. Producers choose a coverage level ranging from 50 to 85 percent of the reference dollar value, which determines the amount of insurance. A loss occurs when the value of the crop is less than the amount of insurance. The value of the crop typically is determined by calculating the average price realized from sales, minus an amount representing harvest costs and other post-production value-added activities, multiplied by the quantity sold.

Pecans are insurable under the Pecan Revenue plan of insurance, which bases the producer's insurance guarantee on an average of his or her historical cash receipts from pecan production. The Pecan Revenue program requires a two year policy as a result of the crop's inherent tendency to alternate bearing. The producer can choose to insure from 50 to 75 percent of the historical average revenue to establish the guarantee. An insured loss results when the value of pecan production is less than the guarantee, whether due to a production/quality loss, a price decline, or some combination thereof. The actual revenue history (ARH) plan of insurance was recently introduced on a pilot basis for cherries. As with Pecan Revenue, the ARH insurance guarantee is based on an average of the producer's historical cash receipts, and an indemnity is paid when the value of production is less than this guarantee.[3] The ARH program design is being evaluated as a basis for providing revenue coverage to other crops that lack a centralized price discovery mechanism (for example, a commodity futures exchange), including citrus, lentils and sugar beets.

Objectives of the Federal Crop Insurance Program

There are three general objectives that govern the administration of the Federal crop insurance program. The first is to provide effective risk management products to producers. The second is to increase program participation by expanding availability into new crops and regions. The third is to maintain actuarial soundness. Critical to achieving the first two objectives is that the insurance products must provide adequate amounts of protection and the associated premium rates must be affordable as perceived by producers. The third objective – actuarial soundness – is required by sections 506(n) and 508(d) of the Federal Crop Insurance Act (Act). The usual measure of actuarial soundness in the insurance industry is the loss ratio, calculated as incurred losses divided by earned premiums. Section 506(n)(2) of the Act, as amended by the 2008 Farm Bill, mandates the Federal crop insurance program operate with a projected loss ratio of no greater than 1.0, which means that premium collections are sufficient to cover the indemnities paid to policyholders.[4]

Yet, there is an inherent tension among the objectives of maintaining actuarial soundness, providing affordable premium rates, and providing an adequate amount of protection. Increasing the amount of protection or adding new coverage will lead to higher premium rates, given the statutory mandate that actuarial soundness be maintained. However, raising premium rates to maintain actuarial soundness will likely dissuade some producers from purchasing a Federal crop

[3] While both Pecan Revenue and ARH provide revenue coverage in a similar manner, the underwriting and administration of the two programs are somewhat different.

[4] Section 502(b)(6) of the Act, as well as section 508(d)(2), specifies that the premium collections shall be sufficient to cover anticipated losses and a reasonable reserve.

insurance policy and/or negatively impact coverage level choices, thereby reducing program participation and program benefits.

Concerns of Perennial Crop Producers

Although perennial crop producers may have declining yield concerns similar to those of annual crop producers, they have relayed specific concerns related to the adjustments to insurance guarantees to reflect the effects of downward trending and alternate bearing. Downward trending reflects the finite commercial life of perennial crops. The productivity of most perennial crops follows a similar pattern, as depicted in Figure 1: (1) establishment – productive capability is zero as the plant is established and growth begins; (2) development – once a certain stage of growth is reached (maturity of the perennial plant), production begins and productive capability increases exponentially until some maximum physiological level is achieved; (3) maintenance – maximum productive capability remains relatively constant for a period of years; and (4) decline – productivity begins to decline as age, disease, etc. reduce the plant's productive capacity. In commercial situations the plant is often kept in production for some period of time after the onset of decline because the cost of replacement (for example, costs of new stock and replanting, no production during the establishment stage, etc.) exceeds the value of the lost production. However, eventually the decline in production becomes so great that it is more profitable to replace the aged tree, vine or bush. The physiological phenomenon whereby productivity begins to decline as the plant becomes aged is referred to as downward trending.

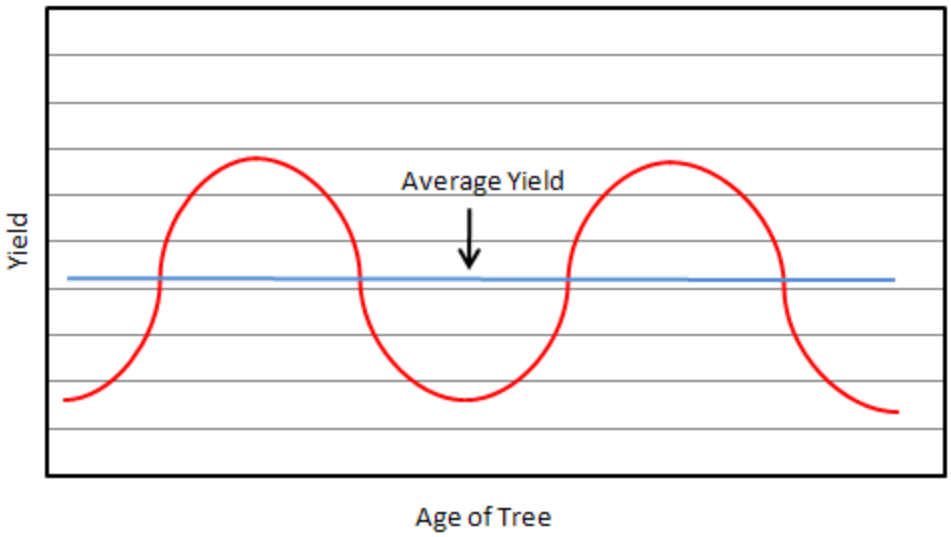
Figure 1: Depiction of Downward Trending for Perennial

Crops

Another physiological characteristic of some perennial crops is alternate bearing – a pattern of alternating years of high and low yields as portrayed in Figure 2. Adverse environmental conditions are often thought to initiate alternate bearing, though some perennials may exhibit the phenomenon even in the absence of environmental stresses. For example, a period of high production may leave plants weakened and stressed and, therefore, more susceptible to damage from freeze, high temperatures, drought, etc. Once such damage is incurred, the plant redirects its resources to repair and recovery rather than to crop production. Thus, a period of high production ("on-years") is followed by a period of low production ("off-years"). Alternate bearing has been documented in certain deciduous fruits, including apple, pear, plums, prunes,

apricot, cranberry, and blackberry, as well as in various citrus fruits. Other perennial crops, such as figs, grapes, and peaches, have demonstrated the ability to produce a full crop every year.

Figure 2: Depiction of Alternate Bearing for Perennial Crops



As discussed in section 2 of this report, RMA procedures provide adjustments to the insured's guarantee to address downward trending and alternate bearing situations. Conceptually adjustments may be appropriate if the insurance guarantee is to be consistent with production expectations – though at the cost of potentially providing the producer with a lower insurance guarantee. The practical impacts of such adjustments (or of not making these adjustments) depend on how prevalent and demonstrable are these phenomena. If downward trending and alternate bearing are relatively prevalent, providing guarantees higher than experience may suggest is warranted will eventually necessitate premium rate increases. Of course, higher premium rates will reduce program participation and/or negatively impact coverage level choices. Yet, reducing guarantees to reflect the effects of downward trending and alternate bearing may be perceived as decreasing the value of the crop insurance coverage. A further consideration is that proper management practices may mitigate the some of the effects of downward trending and alternate bearing, but multiple catastrophic years can erode the effectiveness of even the best management practices. Differentiating between yield declines attributable to downward trending/alternate bearing and declining yield situations due to multiple catastrophic years can be problematic.

Contracted Perennial Crop Evaluation

Recognizing these concerns and issues, RMA solicited proposals for an evaluation of insurance coverage for perennial crops with a particular focus on the alternate bearing and downward trending adjustments. The contract was awarded to Promar International (Promar). The objectives of the evaluation were to:

- Provide a comprehensive evaluation of the existing perennial crop APH insurance program, underwriting methods, and procedures;

- Provide an assessment of whether present underwriting methods and procedures are appropriate to maintain an actuarially sound insurance program and establish uniformity and consistency by crop or crops across RMA regions; and
- Provide recommendations for program improvements.

The contract emphasized a review of RMA's current methods and procedures for adjusting insurance guarantees for alternate bearing or downward trending situations.

To keep the scope of the evaluation manageable, the evaluation was primarily focused on six perennial crops in five regions, as depicted in the Table 1. These six crops account for about 75 percent of total program liabilities for all perennial crops. The five regions account for about 97 percent of national liability for perennial crops. The contractor engaged crop experts from each of the regions to assist in the evaluation, in addition to conducting multiple listening sessions in each region to solicit feedback from producers, agents, and other interested parties. The contracted study was delivered to RMA in April, 2007. A copy of the study is provided as an appendix to this report.

Table 1. Targeted Perennial Crops and Regions

Crop/Region	West	Mid-Atlantic	Pacific-Northwest	Midwest	Southeast
Apples	X	X	X	X	X
Peaches	X	X	X	X	X
Grapes	X	X	X	X	
Oranges	X				
Almonds	X				
Blueberries					X

Subsequent to delivery of the contracted study, RMA established an internal Perennial Crop Review Team that was charged with the responsibility of reviewing the final report, considering other program improvements identified by the team outside of those contained in the contracted evaluation, and providing recommendations on those changes that would enhance the overall program for perennial crops. In particular, the review team:

- Provided recommendations for changes and improvement to the perennial crop underwriting procedure and all related functions, including the rationale identifying the pros, cons and associated impacts of the recommended actions;
- Evaluated required changes to regulations, policies or procedures; and
- Developed implementation timeframes.

The analysis and evaluations conducted by the Perennial Crop Review Team form the basis of the recommendations contained in this report.

2. Underwriting of Perennial Crops

FCIC offers multiple peril crop insurance for perennial crops to cover loss of production due to natural causes, but not losses due to a failure to follow good farming practices or that are inherent to the life-cycle of the plant.[5] The productivity of perennial crops is heavily influenced by the producer's production choices. Examples include variables such as location, climate, soil, cultural practices (for example, crop, rootstock, planting pattern, density, pruning, which includes method and pattern, fertilization, weed control, crop thinning, pest control, insecticide, pollinators, use of bees, disease control, fungicide, and frost control), or other management practices such as gafting, dehorning/buckhorning/stumping, acreage thinning, and interplanting new, similar or different varieties of the same or other crops. These factors are often inter-related, and many are influenced by timing and frequency. This makes the underwriting of perennial crops inherently more difficult as these factors must be addressed when determining coverage and establishing the policy and procedures for insurance.

For APH insurance plans for perennial crops, the insurance guarantee is based on a simple average of four to ten years of actual historical yields (approved APH yield), multiplied by the coverage level chosen by the producer. The assumption behind the simple averaging procedure of the APH plan of insurance is that historical yield performance is the best predictor of future yield performance. Transitional yields (T-Yields) are available to use in place of actual yields when fewer than four years of actual production history are available to determine the guarantee. T-Yields are typically based on county average yields as reported by the USDA National Agricultural Statistics Service (NASS), for the type, variety, practice, etc. as applicable. Establishing T-Yields for perennial crops can be difficult because credible data is often lacking, particularly at the level of detail necessary for perennial crop insurance which may vary by age and density of the trees. For certain perennial crops, minimum age and/or production requirements may also be applicable before insurance attaches.

Adjustments to Historical Average Yields for Perennial Crops

In some situations the historical average yield may also be a poor predictor of future expected yields. Depending on circumstances, there are various potential adjustments to the simple average yield. Of note are the following adjustments:

A. Yield adjustment.
B. High variability.
   - Alternate bearing.
   - Downward trending.
C. Determined yield.

The yield adjustment serves to limit the impact of low actual yields due to insured causes of loss on an insured producer's guarantee. The purpose of the high variability adjustment for downward trending is to reduce the guarantee to be consistent with production expectations when the perennial plant begins to experience a decline in productivity. The alternate bearing

[5] The Federal Crop Insurance Act authorizes indemnity payments only for loss of production resulting from naturally occurring causes of loss such as drought and hail, along with price movements in the case of revenue plans of insurance.

adjustment attempts to adjust the guarantee to reflect the high-low yield pattern present in alternate bearing situations to prevent over and underinsurance. Further discussion of these adjustments is provided below.

A. The yield adjustment (YA) is generally available to perennial crop producers to avoid large year-to-year declines in the approved APH yield. The YA allows producers to substitute 60 percent of the applicable T-Yield for actual yields that are less than 60 percent of the T-Yield due to insured causes of loss in the determination of the approved APH yield. The yield adjustment was introduced by the Agriculture Risk Protection Act of 2000 (ARPA) and implemented for the 2001 crop year.

   In order to benefit from the YA, an insured's actual yield must be less than 60 percent of the T-Yield. For those producers who typically realize yields above the county average, this may be an infrequent occurrence and the yield adjustment generally has little or no effect on their approved APH yield. In contrast, producers with yields below the county average may receive substantial benefit from the YA since a higher proportion of their yields are likely to fall below 60 percent of the county T-Yield. Furthermore, producers with yields that are inherently low may use the YA to increase their approved APH yield even during periods of normal yields. For example, consider a producer whose actual yields typically average only 40 percent of the county T-Yield. The approved APH yield for this producer will nevertheless be at least 60 percent of the county T-Yield because of the YA.

B. RMA's current underwriting procedures provide for a high variability yield adjustment that may be applicable in certain situations to account for the presence of either alternate bearing or downward trending. A series of tests are performed to determine the applicability of either the alternate bearing or the downward trending adjustment for a block or unit, as well as the amount of any applicable adjustment.

C. For situations when the approved insurance provider (AIP) cannot apply the alternate bearing or downward trending tests, an RMA Regional Office (RO) review and determined yield is required. Also, if the insured producer disputes the alternate bearing or downward trending adjustment calculated by the AIP, the insured can request an RO review and determined yield. Other situations that may give rise to an RO determined yield include the approval of insurability at earlier growth stages than specified in the Crop Provisions, or information provided by the producer that indicate reduced productivity, including a change in management practices or an inadequate irrigation water supply.

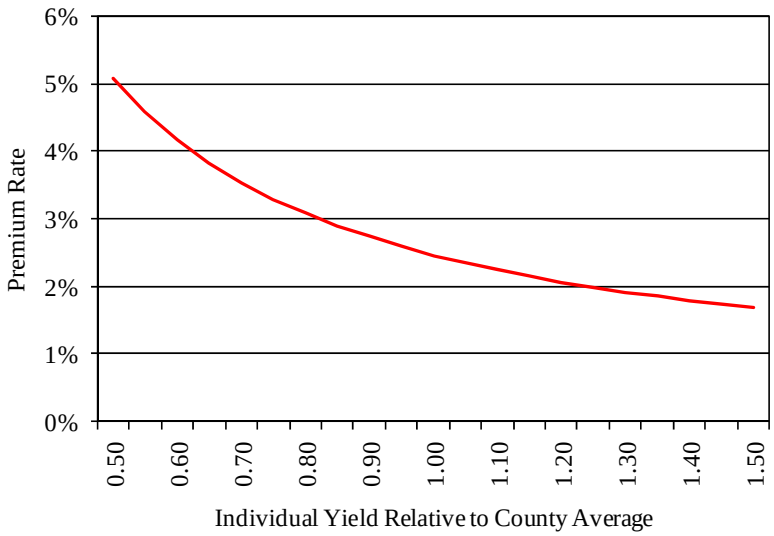
Underwriting and Risk Classification

Most perennial crops are "flat-rated". This simply means that for a given coverage level the premium rate is the same for all producers of the crop in the county. For a few perennial crops, the premium rate for a given coverage level varies based on the producer's risk classification.[6] RMA's rating function, as applied to these latter crops, imply that the risk of an payable loss is a decreasing function of yield, which means that the frequency and severity of payable losses are greater for producers with a below-average yield (relative to the county average) than for producers with an above-average yield. The degree to which an insured's average yield is above

[6] Such a variable rate structure is used for most annual crops insured under an APH-based plan of insurance.

the county average, the insured's premium rate is reduced and vice-versa, as illustrated in the Figure 3. Thus, the average yield not only determines the insurance guarantee but also affects the premium rate paid by the producer.

Figure 3: Relationship Between an Individual's Yield and Premium Rate



The variability of yields that is typical to the growth and production pattern for some perennial crops complicates this method of risk classification, especially when dealing with the individual blocks that are common to many perennial crops such as trees. For example, recall the typical growth pattern of many perennial crops as illustrated above in Figure 1. Yields during the development stage are often lower, though rapidly increasing. Even though yields are lower during this stage, the block may have high vigor and thus be more resistant to damage than it would be at a later stage. In this situation, a lower yield does not necessarily equate to higher risk. Conversely, during the decline stage the perennial plant is considerably aged, downward trending is present, and vigor may be reduced. In this situation, the lower yield may indeed equate to higher risk. As a result, the risk classification for many perennials considers factors other than yield, including practice, type, variety, density, and age.

A further consequence of risk classification based on yield is that when a producer experiences a period of low yields, not only does the insurance guarantee decline but the assessed premium rate increases. This decline in an insured's guarantee, and the corresponding increase in the premium rate, can reduce the usefulness of crop insurance for some participants. This gives rise to pressure on Congress and RMA to do something to mitigate the impact of the low yields on the insurance offer to affected producers. The yield adjustment is an attempt to address concerns about the impact of low actual yields on insurance guarantees. Because this measure increases the guarantee of affected producers and, therefore, generates larger program losses, premium rates are necessarily higher given the statutory requirement that the program be actuarially

sound, as discussed above.[7] Similarly, eliminating the downward trending and alternate bearing adjustments may lead to larger program losses and higher premium rates – if these two phenomena occur with regularity and guarantees are not appropriately adjusted. Producers, however, have concerns regarding the appropriateness of the downward trending and alternate bearing adjustments and with the consistency of these adjustments between regions. Therefore, the key issues are: (1) how prevalent are the downward trending and alternate bearing tendencies; and (2) how appropriate are the current procedural adjustments to address these situations. The conclusions of the contracted study with regard to these and other issues are presented in the following section of the report.

[7] Section 506(n)(2) of the Federal Crop Insurance Act, as amended by the 2008 Farm Bill, requires the federal crop insurance program to operate with a loss ratio of no greater than 1.0, i.e., premiums collected must approximately equal indemnities paid. The immediate implication of this requirement is that as indemnities increase, so too must premium rates increase if actuarial soundness is to be maintained.

3. Summary of Findings from the Contracted Study

The complete Promar evaluation of the perennial crop APH insurance program, underwriting methods, and procedures is provided as an appendix to this report. A summary of the study's key findings is provided below, with a particular focus on issues surrounding downward trending and alternate bearing.

Incidence of alternate bearing and downward trending

The Promar evaluation found that adjustments for alternate bearing and downward trending are relatively infrequent based on an analysis of over 50,000 APH databases for the perennial crops under study. About 2.3 percent of the APH databases were adjusted for alternate bearing, and about 1.7 percent of the databases were adjusted for downward trending. An additional 3.7 percent of the databases had RO determined yields. The variation among regions regarding the incidence of alternate bearing and downward trending was not great, though the frequency of adjustments tended to be lowest in the West region. However, the West region accounted for the largest number of adjusted databases, primarily because the region accounts for such a large share of perennial crop production.

Length of APH period

The APH program is premised on the idea that an individual's past production history (actual production history) is the best predictor of his/her expected (future) production, and is therefore the most appropriate basis for establishing the individual's insurance guarantee. However, perennial crops tend to exhibit much greater yield variability than do annual crops, even in years of "normal" weather. In particular, the Promar study found that the average yield deviation for the perennial crops under study generally ranged from 25 to 50 percent, expressed relative to the average yield of the corresponding APH database. Based on this finding, Promar evaluated the predictive ability of alternative (shorter) time periods for constructing an APH database, relative to the standard 10-year APH database. The study concluded that a shorter (4-6 year) average is at least as accurate as a 10-year average, as indicated in the following excerpt:

> *In light of the above, we conducted a set of tests intended to determine whether a shorter experience period would predict yields as well as or better than the standard ten years. In general, our approach was to calculate successively shorter "APH periods" (nine year average, eight-eight year average ... through four-year average), and to compare these to the actual yields. We measured the difference between the predicted and average yield, and averaged this difference for all usable databases. Our conclusion is that a 4-6 year average works as well as or better than longer period averages.*

Alternate bearing

Promar conducted listening sessions at 13 locations across the country in the course of their evaluation. The consensus opinion among the participants, which included producers, insurance providers and academic researchers, is that alternate bearing is not a major issue or concern among perennial crop producers. This is because cultural practices have enabled producers to largely mitigate the impact that alternate bearing would otherwise have on production patterns. The exception is citrus for which specific cultural practices are not used to manage alternate bearing tendencies.

Promar also evaluated the effectiveness of the alternate bearing adjustments using tests of accuracy and persistency. The test of accuracy compared the predictive ability of the current alternate bearing adjustments to the predictive ability of various alternatives for determining the approved APH yield. The contractor concluded that a four or five year APH database was as accurate as the current alternate bearing adjustments. For the test of persistency, Promar assessed whether perennial crops continued to exhibit the alternate bearing pattern after the alternate bearing adjustment had been triggered. The contractor concluded that, in general, the expected pattern was realized less than half of the time. In addition for an approximately equal number of cases, the outcome was opposite that which would be expected from alternate bearing. Given these results, Promar concluded that the alternate bearing adjustments should be generally eliminated in favor of a shorter APH database, though RMA regional offices would retain optional authority to adjust APH databases for alternate bearing if warranted.

> *We concluded that these two tests provide very strong arguments for eliminating the alternate bearing adjustment as a general requirement. The alternate bearing test should certainly not be applied to crops like peaches, nectarines, figs and grapes where it is not a documented phenomenon. More generally, however, the inability of the CIH formula to do a better job than a simple average predicting the next season's yield, coupled with the evidence of low persistence of the up-down pattern, lead us to conclude that the test is of little benefit in aggregate.*

Downward trending

As with alternate bearing, downward trending was not identified as a major issue or concern in the listening sessions. Producers recognize that most perennial crops have a limited commercial lifespan, that yields will eventually begin to decline, and that insurance guarantees should appropriately reflect the effects of downward trending.

Similar to alternate bearing, Promar evaluated the effectiveness of the downward trending adjustments using tests of predictive ability and persistency. The test of accuracy compared the predictive ability of the current downward bearing adjustments to the predictive ability of various alternatives for determining the approved APH yield. The current downward trending adjustments perform better than a simple 10-year average. However, the predictive ability of the four or five year averages is equal to that of the current downward trending adjustments. The persistency test assessed the percentage of APH databases that continue to exhibit the downward trending pattern after the downward trending adjustment has been triggered. Similar to alternate bearing, less than half of the databases showed a continuation of the downward trending pattern. Promar concluded that a shorter (4 or 5 year) APH database would generally perform approximately as well as the current downward trending adjustment.

> *Down[ward] trending yields are a fact of life at some point for most of these crops. None of the formula adjustments do a very good job of predicting the coming year's yield. Only about half the time is the next year's yield actually below 75% of the APH. Nevertheless, our tests indicate that the CIH downward trending adjustment more accurately predicts yields than the APH yield for crops with a 10-year APH. However, moving to a shorter (four to six) year average would do almost as well.*

4. RMA Recommendations

Section 12030 of the 2008 Farm Bill directed the Secretary deliver to Congress a report on options for addressing the effects of declining and variable yields for perennial crops in the federal crop insurance program. Congress was particularly interested in the administrative options open to RMA for addressing these issues. The RMA Perennial Crop Review Team evaluated the findings of the contracted evaluation and conducted additional analysis in developing its recommendations for the perennial crop program. These recommendations were reviewed within the agency before being formalized as RMA's recommendations.

As directed by Congress, below are RMA's recommendations for addressing the effects of declining and variable yields for perennial crops, including a discussion of the changes that can be accomplished administratively and those that require enabling legislation. These recommendations are an effort to unify the crop insurance program for perennial crops, improve underwriting methods and procedures to maintain an actuarially sound insurance program, establish uniformity and consistency by crop or crops across RMA regions where appropriate, and enhance the overall program for perennial crops. These changes would impact the APH-based perennial crop programs, and other perennial plans of insurance. A brief synopsis of the major recommendations for the perennial crop program is provided below:

1. Greater flexibility to establish the base period and method for determining the approved yield, for example, by shortening the base period for establishing the approved yield from 10 years to a shorter period. The contracted evaluation indicates that an approved yield based on a shorter time period can provide a more appropriate guarantee reflective of the current growth stage and capabilities.

2. Use producer history for catastrophic yield adjustments for APH-based perennial crop programs in place of the current adjustments based on regional average yields. Basing a catastrophic adjustment on T-Yields derived from regional average yields may not be equitable, particularly for perennial crops as yields may vary by plant density, age, etc. For example, producers with expected yields well above the county average arguably receive inadequate benefit from a county-based catastrophic adjustment. Conversely, producers with expected yields well below the county average arguably receive excessive benefit.

3. Restrict the applicability of the alternate bearing and downward trending adjustments as a shorter base period is implemented. The shorter base period will generally provide adequate responsiveness to changes in the crop's productive capability, negating much of the need for the current high variability adjustments.

4. Enhance policy and procedure for adjustments in measured acreage when there is a significant reduction in the stand from the previous year. Currently all acreage in the block may be counted in the acreage determination, even though a significant portion of the acreage may be out of production (for example, a storm uproots a large number of trees). By including all acreage the approved yield may be greatly reduced and the premium rate much higher (for perennial crops with variable rates), but the undamaged acreage remaining in production is no less productive than prior to the storm.

5. Modify the Pecan Revenue program to specify a minimum level of revenue that must be achieved as a condition of insurability, reduce the minimum age requirement, and add percent stand requirements similar to other nut crops such as almonds. A catastrophic adjustment based on the producer's history would also be implemented for pecan growers, similar to that of other perennial crops as indicated in recommendation 2.

RMA is able to administratively implement certain of the recommendations listed above. These changes will help to clarify procedures and increase standardization across the perennial crop program. RMA has recently incorporated the recommended changes in the measurement of perennial crop acreage with the release of the 2009 and 2010 crop year Special Provision statements (recommendation 4 above). RMA is also working to strengthen and clarify current underwriting procedures for acreage determinations and adjustments. The recommended changes specific to the Pecan Revenue program also can be implemented administratively, though some will require changes to policy language (recommendation 5 above). Changes to policy language will require publication of the proposed changes in the Federal Register to allow the public the opportunity to review and comment.

Restricting the applicability of the high yield variability adjustments can technically be accomplished administratively (recommendation 3 above). However, RMA does not believe that it would be prudent to implement this recommended change without both the recommended change to the base period (recommendation 1 above) and the replacement of the YA with a catastrophic adjustment based on the producer's own production history (recommendation 2 above). Implementing only the restriction on the high yield variability adjustments may not be actuarially appropriate and could result in unacceptable premium rate increases. However, recommendations 1 and 2 both require changes in statute in order for RMA to proceed with implementation. Current legislation mandates a 10-year base period for all crops, thus necessitating a change in statute to allow a shorter base period for perennial crops. The use of actual production histories to establish catastrophic yield adjustments is an innovation that RMA believes would also benefit its annual crop programs. As a result, the declining yield report will provide more specific recommendations to enable RMA to proceed with recommendation 2.

Budgetary Impact of Recommended Changes

RMA's analysis of recommendation 1 indicates adoption of a shorter base period for perennial crops will result in a relatively small increase in liability, estimated to be approximately $20 million annually based on data for the 2006 and 2007 crops. Accordingly, this change would be scored as an increase in program costs because premium subsidies, administrative and operating (A&O) subsidies and indemnities would increase by a similar amount. Recommendation 2 – a catastrophic adjustment based on the producer's yield history – is also applicable to annual crops, which will likely be a far larger determinant of potential costs as compared to perennial crops. Analysis of recommendation 2 as applied to both annual and perennial crops is ongoing and will be addressed in the forthcoming declining yields report. The legislative changes (and associated scoring impacts) to accommodate recommendation 2 would also be applicable to the catastrophic adjustment for pecans (part of recommendation 5).

Implemented in isolation, recommendation 3 would result in an increase in program costs. As noted above, RMA does not intend to implement recommendation 3 until it is also able to implement recommendations 1 and 2. Thus, implementation of recommendation 3 would have only a minimal budgetary impact. Most perennial crops are flat-rated, i.e., the premium rate is not a function of yield. Thus, recommendation 4 has no budgetary impacts for these perennial crops. For the few perennial crops that are not flat-rated, recommendation 4 would actually result in small program savings. This is because the earned premium rate for these crops would decline while liability is unchanged, resulting in lower premiums, premium subsidies, A&O subsidies, and indemnities. Aside from the catastrophic adjustment, the remaining elements of recommendation 5 are largely routine program maintenance to assure program integrity. The minimum revenue and percent stand requirements of recommendation 5 are somewhat more stringent underwriting standards. Reducing the minimum age requirement recognizes current production practices that allow pecan trees to reach full production earlier in their life cycle.

Appendix

Contracted Study:
Evaluation of Perennial Category C APH Crop Insurance Program